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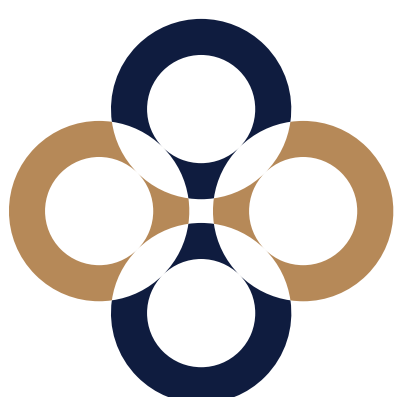**Sándor, Bozóki;**   Luca, Faramondi;   Gabriele, Oliva;   Roberto, Setola

Abstract:

In the context of decision making, pairwise comparisons matrices (PCMs) based on a ratio scale are essential for deriving absolute preferences from relative comparisons. Such techniques are based on Subject Matter Experts (SMEs), which express their relative judgements on pairs of alternatives, providing pairwise comparison information, also in the case of incomplete or uncertain data, in order to obtain an absolute ranking about the alternatives. In this work, we propose a novel approach, complementary to measuring inconsistency, able to integrate and evaluate the concept of uncertainty in PCMs in order to verify the credibility of the final outcome. Such approach characterizes how SMEs' uncertainty reflects into rank reversal. This is done via a novel optimization problem aiming to identify the smallest perturbations of the pairwise comparison values which result in an altered ranking of alternatives, e.g., reverting the ranking for at least a pair of alternatives.

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